Shakespeare (E. O.) & French (M. S.)

EPIDEMIC OF TYPHOID FEVER, AT PLYMOUTH, PENNSYLVANIA.

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DR. E. O. SHAKESPEARE gave a verbal report of the investigations which Dr. M. S. French and himself, at the request of the Mayor, had made concerning the nature of the Plymouth epidemic.

They had reached Plymouth on Saturday night, May 9, and on Sunday had an opportunity of making a post-mortem examination on one of the patients who had died from perforation. Well-marked evidences of peritonitis were found, the point of perforation being readily seen. On opening the intestine, the characteristic lesions of typhoid fever were well marked. The spleen and the liver were also enlarged and softened. Other post-mortems were made, showing the same condition. The clinical history of patients examined, also corresponded to typhoid fever. They had remained at Plymouth two days.

He then gave the following descriptions of the conditions under which the epidemic arose:—

The town of Plymouth nine months out of the twelve is supplied with water from a mountain stream, and during seasons of drought, occurring usually three months in the year, water from the Susquehanna River is pumped directly into the mains at the lower portion of the town.

In consequence of the frozen condition of all the streams in that portion of the country surrounding Plymouth, about the 20th of last March the usual mountain source of water supply became inadequate and, therefore, the water company began on that date to pump water from the Susquehanna directly into the mains in the lower streets of the town, while the upper streets on the hillside were still supplied from the reservoirs of the mountain stream. The pumping from the river continued until the evening of the 26th, when a sudden thaw, accompanied by slight rains, again filled the reservoirs.

During the period of pumping from the Susquehanna, the water in that river was lower than it had been at any time for years, and the surface was frozen tight. The city of Wilkes-Barre, containing 30,000 inhabitants, delivers its sewage directly into the Susquehanna, the mouth of the lower sewer emptying only two miles above the Plymouth pumping-station, while the current is very rapid between the two towns. The water is further contaminated by refuse water from five or six mines, as well as by the garbage from the abattoirs at Wilkes-Barre. Notwithstanding this unusually filthy condition of the Susquehanna water, it is beyond question entirely innocent of causing the epidemic, for the following and other reasons:

There was less of typhoid fever in Wilkes-Barre at that time than usual. A section of Plymouth supplied exclusively by the Susquehanna water and by a few wells, containing a population of 800, is entirely free from the disease, except in the cases of eight persons, five of whom, previous to their attack, had been in the habit of going into the town and drinking the mountain water, while two were recent cases of secondary infection. In other portions of the town the extent of the disease was in direct ratio to the amount of mountain water used, and averaged 1–10 of the population.

The lower portion of the town was principally supplied with the river water during the time of the pumping, while the upper portion at the same time received the greatest supply of mountain water. The rate of sickness is two cases in the upper portion to one in the lower, the latter also having been partly supplied from the reservoir.

The mountain stream has four reservoirs, the lower one distributing water throughout the town. The water in all the reservoirs was nearly exhausted at the time of the pumping, and they were also frozen. The mountain stream is a small one, running down over a rocky bed, and on a declivity not eighty feet from its bed a dwelling is situated, wherein, during January, February and March, was located a case of typhoid fever that is only now convalescent, the worst period of the case being about the 20th of March. The attending nurse was in the habit, during each night, of carrying the excreta from the patient and depositing it on the ground towards the stream. The ground during all this time was frozen and covered with snow, until the thaw and rain

already alluded to occurred. The poisonous character of the dejecta is not destroyed by freezing, but is only kept in a state of hibernation. A great part of the three months' accumulation of dejecta was suddenly swept into the rapidly running stream, and reached the lower reservoir as quickly as a man walking fast could have arrived there.

In fifteen days from this time the epidemic began, fifty cases occurring daily between the 10th and 20th of April. Up to the present, twelve hundred have been sick and one hundred have died out of a population of eight thousand. For the first three weeks the few people in town who used well water exclusively escaped the disease. The period of incubation varies between ten and twenty days, or longer, and therefore no other conclusion can be arrived at than that the infective poison existed in the mountain water and originated from the one case of fever in the house on the side of the stream.

The doctor went on to say, that although those people who used the water from the pumps in the town escaped at first, it was now found that the new cases developed in those who use well water. This was due to constant neglect to disinfect the excreta of the patients sick with the disease. In many cases they were thrown only a few feet from the well, and in this way the well water was now becoming contaminated. The people early became afraid of the hydrant water, and were now in great numbers resorting to the wells. Therein is the danger of a continuance and further spread of the epidemic.

Notwithstanding the frightful lesson which the one case of the fever along the source of water supply had taught the doctors and the people, not one precaution against the possibility of secondary infection from the sick in Plymouth had been taken. Drs. French and Shakespeare were the first to inform the local Relief Committee and the people of their present danger, and to draft for them sanitary rules looking to disinfection of the excreta, and to rendering the drinking water, milk, and food harmless. They had occupied none of their limited time in looking into the milk or other food supply, for the reason that these could not possibly have been so universally contaminated as would have been required for them to have caused the sudden outbreak all over the town.

They regarded this Plymouth epidemic of typhoid fever as

unique in many respects. It is one more proof that there is required for the production of typhoid fever something more than the mere contamination of drinking water by common sewage or fæcal matter; that, on the contrary, for the production of the specific, infectious, and altogether characteristic disease, known as typhoid fever, there must be introduced into the human organism a specific, infectious and characteristic cause, which is elaborated by and transmitted from a previous person sick with the disease.

It is one more example of the great injury to the public which may follow neglect of the use of disinfectants in the handling of isolated cases of infectious disease, and it is one more rebuke to those who, in spite of our modern knowledge concerning the infectious nature of typhoid fever, constantly neglect the practice of systematic disinfection.

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